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A STUDY OF LeCONTE'S SPECIES OF THE  
CHRYSOMELID GENUS *GRAPHOPS* WITH  
DESCRIPTIONS OF SOME NEW SPECIES

BY DORIS H. BLAKE

WITH SIX PLATES

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No. 4—A Study of LeConte's Species of the Chrysomelid Genus  
*GRAPHOPS* with Descriptions of some New Species

BY DORIS H. BLAKE

For the last 20 years of his life the late Herbert Spencer Barber was interested among other things in the genus *Graphops*. He left a manuscript that consists of notes on the different species, in particular the strawberry rootworm, *G. marcassita* (Crotch), as well as a description of the genus and key to the species. In the U. S. National Museum collection he had distinguished five new species and attached manuscript names to them. Two of these are old species that he failed to recognize, never having had a chance to examine the LeConte types until a few weeks before his death. It was no fault of his that he did not recognize these species because they are all much alike and the short descriptions by LeConte in his posthumously published key are not sufficient to differentiate them. Mr. Barber's handwritten pages for the most part amount to disconnected notes that he made at intervals during his busy years of identification work. His key I cannot use since he recognized only 9 species whereas I have 18. I have worked with much more material than he had, from collections that have been lent me. Likewise his description of the genus, which is mainly made up of a discussion of the specific differences, is not adequate. I have been more fortunate than he in that I have been able to examine LeConte's types at regular intervals during my study. Moreover I have had time for concentrated work which Mr. Barber never had. Great credit should be given him for the many fine dissections that he made of the specimens that from time to time came into the collection.

The first two species of the Chrysomelid genus *Graphops*, *pubescens* and *curtipennis*, were described by Melsheimer<sup>1</sup> in 1847 under the genus *Eumolpus*. In 1859 LeConte<sup>2</sup> described *nebulosa* and *smaragdula* under the old Chevrolat generic name *Heteraspis*, unaware that the name had been used by Blanchard<sup>3</sup> for African and East Indian species. Blanchard in starring the

<sup>1</sup> Melsheimer, Proc. Acad. Nat. Sci. Phila., vol. 3, 1847, p. 169.

<sup>2</sup> LeConte, Coleop. Kansas and New Mexico, Smithsonian Contrib., 1859, pp. 23, 24.

<sup>3</sup> Blanchard, Emile, Histoire des Insectes, vol. 2, 1845, pp. 186, 190.

monobasic on *Eumolpus vittatus* Olivier, the formal designation of that species as its genotype was done by Chevrolat 1845 (in D'Orbigny Diet. d'Hist. Nat., vol. 6, p. 596). *Scelodonta* Westwood (monobasic type, *S. curculionoides* Westwood) seems to be a junior synonym of *Heteraspis*." Thus, if the two genera were to be united, the North American species would revert to LeConte's first genus, *Heteraspis*.

LeConte briefly summarized the salient characters of the genus *Graphops* as follows: (1) being pubescent; (2) the head as having two deep impressed lines connected in front between the antennae and running obliquely backwards and curving around the upper and back margin of the eyes; in *Metachroma* the lines are in front of the antenna; (3) the prosternum has a straight outline beneath; and (4) the claws are variable in the extent of the basal tooth.

To this brief description may be added that the head is more or less densely punctate and pubescent, with a median depressed line or simply a median depression above the transverse line connecting the deep cleft about the eyes. This transverse line, in reality made up of two lines forming an angle and usually at the peak uniting with the depressed median line, is variable in the extent to which it is impressed. In a few species there is little evidence of it, and the upper and lower front are not separated by it. But ordinarily there is an impressed line or depression or even sulcus between the upper and lower front. In the lower front the clypeus or region right over the mouth is variously shaped. In some species it is deeply and angularly emarginate, in others feebly angularly emarginate, grading into roundly emarginate, and rarely almost straight or truncate across. The antennae present little difference in the various species, the first joint is large and rounded, the next five small, shiny and subequal, and the distal joints wider and hairier. The antennae do not come much below the humeri. The pronotum varies in shape and the degree of punctation. It is always wider than long, rounded more or less on the sides, without depressions, and more or less punctate and pubescent, often with small smooth roundish areas. The scutellum is usually pentagonal, like that of *Heteraspis*, whence the name "different shield." The elytra are usually wider than the prothorax and

vary in length, from long in *pubescens* to short in *curtipennis*. Compared with the humeri in the Oriental species, the humeri in these are small as well might be the case in beetles with poorly developed wings. The elytral punctation is striate although in a few species there are punctures between the striae that make the elytra seem confusedly punctate. The pubescence is variable, in some the elytra have patches of denser pubescence, in others, the hairs are evenly distributed, or as in *curtipennis*, in lines converging towards the suture at the apex. In one species from Arizona the pubescence is so inconspicuous as to be almost absent, whereas in other species it is so long and heavy as to obscure the punctation below. In all, the pubescence is white. There are some brilliantly metallic species and usually these are larger, but the majority are small, 2 to 5 mm. long, and black or bronzy. There is usually great variation within a species, some specimens may be bronzy and others bright metallic green. The body beneath is more or less coarsely punctate with the legs also punctate, and the pubescence is often dense on the sides of the breast and sides of the abdomen. The femora are robust and the front ones of a few species minutely toothed. The tibiae of the middle and posterior legs are emarginate near the apex, and the claws have a longer or shorter basal tooth. In *G. nebulosa* and related species the claws are more widely separated. In most species the wings are not well developed and in an Arizona species they are so small that it is doubtful whether the beetle can fly at all.

Three species, *G. pubescens* (Mels.), *G. curtipennis* (Mels.) and *G. marcessita* (Crotch) appear to occur in abundance and are found in a wide range from the Atlantic coast westward. The rest of the species are not at all well represented in most collections examined. This may be due to the fact that the beetles are overlooked because they live near the ground. Besides these three species there is one other undescribed species in the east from Florida and the Gulf states and a subspecies of it known only from three specimens, two from New Jersey and one from Long Island. One of the western species has been found in the mountains of western Georgia and may be a race by itself. I have seen only five specimens of it. All the rest are from the middle states and western plains from Manitoba to Texas and Arizona and west to Colorado and Wyoming. So

far none is known from Mexico or Central America. Two, one of which is probably a subspecies of *G. marcassita* (Crotch) and the other *G. pubescens* (Mels.) occur in Washington State, and there is one record of *G. pubescens* from California. A number of species are found in Canada, one of which is described in this paper and known only from Canada.

It seems likely that in the course of time specimens will be collected in Mexico and new ones taken in this country. In the material seen there are isolated specimens or a single series represented. For instance, I have seen only one specimen of *G. obscurus* LeConte, the type, and in this paper have described two species from one specimen apiece. In the case of one group I have so little material that I cannot come to any better conclusion than did LeConte who named them all "*varians*." They no doubt represent several species. Within almost all the units that I have distinguished as species, there is great variability in size and coloration. Since no real characters to differentiate these variant forms can be found, and since the aedeagi show no great differences, one can only group these diverse-appearing specimens together tentatively under one specific name, after calling attention to the minor differences and hope that sometime greater series may be collected and more biologic work done in observing the hostplants. Another group of which *G. nebulosa* is a representative, appears to have developed some faint characters to differentiate the different races. But whether these races are specific or subspecific one cannot at this stage determine.

Of the three most abundant species, *G. pubescens* is well known to feed on *Oenothera*. *G. marcassita* breeds on the roots of strawberry, and *G. curtipennis* has been collected by J. C. Bridwell in Virginia on *Hypericum perforatum*, and the Florida subspecies by W. S. Blatchley in Florida on *Asyrum hypericoides*, of the St. Johnswort family (Hypericaceae). A new species here described has been collected in Texas and New Mexico on *Gaura parviflora*, which is related to *Oenothera*, and *G. nebulosa* and *G. varians* are reported by Norman Criddle in Canada on *Oenothera*, and *G. bicolor* from Texas on *Oenothera*. Other than these records we know almost nothing about the hostplants, the few records of the other specimens being apparently chance captures on plants that probably bore little relation to the actual host.

The only life history of any of the species is that by Forbes<sup>10</sup> who made observations on three strawberry rootworms, *Colaspis brunnea* (Fabr.), *Paria aterrima* (Oliv.), and *Scelodonta (Graphops) pubescens* (Mels.). The last one was so identified by LeConte to whom he had sent his beetles, and who at that time was away from his collection and in failing health and with poor eyesight (he lived not much longer). Forbes later compared the strawberry *Graphops* with the one feeding on *Oenothera* and, questioning the identification of the strawberry one as *pubescens*, sent both to Horn, who identified the *Oenothera* beetle as *pubescens* and the strawberry one as *G. nebulosa* (LeConte). Forbes' drawing, poor as it is, is not that of either *pubescens* or *nebulosa*, and is probably that of *G. marcessita* (Crotch), which is the strawberry feeder. According to Forbes, the strawberry *Graphops* in the latitude of southern Illinois attacks the strawberry roots in August and September, spends the winter as a larva, pupates in May, and emerges as an adult in June. Forbes, finding adults of *G. pubescens* in April on *Oenothera*, was thus led to compare them with the strawberry species and he quickly noted their difference both in habits and in appearance.

I am indebted to the following institutions and men who have freely put their collections before me: W. J. Brown, Dept. of Agriculture, Ottawa, Canada; P. J. Darlington, Museum of Comparative Zoology; R. H. Beamer, University of Kansas; L. J. Bottimer; H. M. Harris, Iowa State College; J. N. Knull, Ohio State University; Hugh Leech, California Academy of Sciences; C. E. Mickel, University of Minnesota; John C. Palfister, American Museum of Natural History; H. C. Severin, South Dakota State College; John A. Wilcox, New York State Museum, and the U. S. National Museum.

*Key to Species of GRAPHOPS*

- |  |                       |
|--|-----------------------|
| 1. Pubescence fine and inconspicuous, beetles dark bluish or purplish green, elytral humeri small. Arizona . . . . . | <i>barberi</i> n. sp. |
| Pubescence usually coarse and conspicuous, humeri not notably small . . . . .  | 2                     |
| 2. Front femora with a small tooth . . . . .   | 3                     |
| Front femora without tooth . . . . .   | 6                     |

<sup>10</sup> Forbes, *Psyche*, vol. 4, 1884, pp. 123-130, 167-168.

3. Elytra considerably over twice as long as prothorax, densely punctate in basal half of elytra. Widespread . . . *pubescens* (Melsheimer)  
Elytra approximately twice as long as prothorax or a little more, elytral punctation not dense . . . . . 4
4. Elytra with a conspicuous patch of white pubescence on either side of the scutellum, elytral punctation coarse. South-eastern states . . . . . *floridana* n. sp.  
Elytra without conspicuous patch of white pubescence on either side of scutellum, elytral punctation not coarse . . . . . 5
5. Punctation on prothorax in transverse wrinkles, strigose. Widespread in eastern and middle U.S. . . . . *curtipennis* (Melsheimer)  
Punctation on prothorax fine and dense but not strigose. Long Island, New Jersey . . . . . *floridana borealis* n. ssp.
6. Beetles dull black without lustre . . . . . 7  
Beetles with more or less lustre and either bronzy, coppery, or metallic blue or green . . . . . 8
7. Punctation of prothorax dense, round and deep; pubescence fine and evenly distributed. Colorado . . . . . *obscura* LeConte  
Punctation of prothorax not so dense or coarse and in clusters with some roundish impunctate areas, pubescence coarse and in thicker patches on elytra. Colorado . . . . . *nigella* n. sp.
8. Clypeus with deep angular emargination . . . . . 9  
Clypeus with shallow wide-angled emargination . . . . . 13  
Clypeus with rounded emargination . . . . . 18
9. Front of head without transverse impression or sulcus connecting the supraorbital cleft. Elytral punctation dense over entire elytra. Kansas, Oklahoma, Mississippi, Texas  
*simplex* LeConte  
Front of head with more or less evident transverse impression or sulcus connecting supraorbital cleft . . . . . 10
10. Eyes concealed from above by bulging occiput. Prothorax and elytra with coarse white pubescence, in unrubbed specimens concealing the punctures below. Coppery or bronzy. Texas, New Mexico . . . . . *comosa* n. sp.  
Eyes not concealed from above by bulging occiput, pubescence not so dense as to conceal entirely the sculpture beneath. Usually metallic blue or green . . . . . 11
11. Large (5.5-6 mm.). Prothorax very densely punctate all over and duller than the elytra, deep bluish green. Nebraska, Minnesota, Colorado, Wyoming . . . . . *beryllina* LeConte  
Somewhat smaller, shining blue, green, coppery or bronzy. Prothorax not so densely punctate . . . . . 12



12. Elytra with striate punctures closely set and strong even to the apex. Locality unknown ..... *punctata* n. sp.  
Elytra with striate punctures not very closely set and becoming much finer and indistinct towards apex. Manitoba, South Dakota, Colorado, Kansas, Missouri, Iowa, Illinois, Georgia  
*varians* LeConte
13. Tip of aedeagus with a more or less broad end ..... 14  
Tip of aedeagus with an acute end ..... 15
14. Aedeagus with a broad blunt tip. Texas ..... *exilis* n. sp.  
Aedeagus with not so broad but blunt tip. Wyoming  
*wyomingensis* n. sp.
15. Dull black. Colorado, Manitoba ..... *nigella* n. sp.  
Metallic blue green, bronzy or coppery ..... 16
16. Metallic blue green. Colorado, W. Kansas, New Mexico, Texas ..... *smaragdula* (LeConte)  
Bronzy or coppery ..... 17
17. Small. Texas, New Mexico ..... *tenuis* n. sp.  
Larger. Manitoba, Montana, Wyoming, South Dakota, Colorado, Nebraska ..... *nebulosa* (LeConte)
18. Punctuation in basal part of elytra dense and somewhat confused, beetle bluish green. Saskatchewan ..... *viridis* n. sp.  
Punctuation in basal part of elytra not dense or confused but striate. Beetle bronzy. Widespread over U. S. and Canada ..... *marcassita* (Crotch)

## GRAPHOPS PUBESCENS (Melsheimer)

## Plate 1, Figure 2

*Eumolpus pubescens* Melsheimer, Proc. Acad. Nat. Sci. Phila., vol. 3, 1847, p. 169.

*Heteraspis pubescens* LeConte, Col. of Kansas and Eastern New Mexico, Smithson. Contrib., 1859, pp. 23, 24.

*Graphops pubescens* LeConte, Trans. Am. Ent. Soc., vol. 12, 1884, pp. 26, 27.  
Horn, Trans. Am. Ent. Soc., vol. 19, 1892, p. 205.

Elongate oblong oval, bronzy black somewhat shiny although faintly alutaceous, with light, unusually fine pale pubescence; prothorax distinctly and densely punctate, elytra with fine striate punctuation and in basal half punctures between the striate rows; the elytra unusually long for the genus.

Head rounded over occiput with a distinct shallow frontal depression but no impressed line or sulcus across dividing the

upper from the lower front and connecting the deep sulcus about the eyes; surface alutaceous and distinctly punctate, more coarsely in lower front, the clypeus cut straight across, not at all emarginate; pubescence fine and inconspicuous, nowhere dense. Antennae with rounded basal joint, the last five joints somewhat wider and more pubescent than the short shiny basal joints. Prothorax wider than long with rounded sides, not very convex, surface shiny although faintly alutaceous, and densely and strongly punctate; the punctures in transverse lines on sides and towards the base, slightly pubescent. Elytra elongate, somewhat shiny, faintly alutaceous, the striate punctation not at all coarse and in basal half with finer punctures in intervals, towards apex the punctation becoming fainter; the pubescence fine and inconspicuous. Body beneath densely punctate, lightly pubescent except on sides of metasternum and to a lesser extent on sides of abdomen where the hairs are denser. Femora very finely and inconspicuously toothed, claws with a long inner tooth. Length 3.2 to 4.4 mm.; width 1.5 to 2 mm.

*Type* in Melsheimer or LeConte collection, Museum of Comparative Zoology. In the Melsheimer collection a female with label "*pubescens* Melsh." and two others with pale blue discs and "Ziegler" on them. In the LeConte collection is one with a pink disc (indicating the Middle Atlantic States), labelled *pubescens* Melsh. in LeConte's handwriting. There are, besides this one, 9 others, 2 with pink discs, 1 from Canada, 4 from New Jersey (not this species but *marcassita*), 1 from Dallas, Texas, and 1 from Texas (not this species). There is also a series on cardboard from New Jersey.

*Other localities.* *Canada:* Nova Scotia: Newport, W. J. Brown. Quebec: Joliette, Moznette; Rigaud; Ontario: Toronto, R. J. Crew, Wickham; Brome, W. J. Brown; Constance Bay, W. J. Brown; Meij Bleue, Merivale, Ottawa, all collected by W. J. Brown; Ridgeway, E. P. Van Duzee. Prince Edwards Co. Manitoba: Aweme, N. Criddle. *Maine:* Milford, F. Knab. *New Hampshire:* Mt. Surprise, Intervale, E. L. Bell. *Vermont:* Brattleboro. *Massachusetts:* Boston, Ormonde; Cambridge, Hubbard and Schwarz; Chicopee, F. Knab; Springfield, F. Knab. *Connecticut:* Sheffield Island, J. Zabriski. *Rhode Island:* Newport, W. Robinson. *New York:* Albany; Batavia, H. H. Knight;

Clinton Hts.; Colden, E. P. Van Duzee; Crugers; Cypress Hill; Forrest Park, Schaeffer; Highland Park, Schaeffer; Ithaca, Chittenden; Karner, J. A. Wilcox; Long Island, M. L. Linell, A. T. Slosson; McKeever, J. A. Wilcox; Newport; Palmyra, E. M. Becton; Pelham, L. Lacey; Phoenicia, E. P. Van Duzee; Redford, Schaeffer; Riverhead, L. I., V. M. Kirk; S. Bethlehem, N. K. Bigelow; Sound Beach, L. I.; Suffolk Co., C. V. Relchart; West Point, W. Robinson. *New Jersey*: Bridgeport, Halmbach; Boonton, G. M. Greene; Cape May, F. Knab; Clementon, Kaefer; Clifton, R. Godfrey; Delanco, George Greene; Floral Park; Holly Beach, Halmbach; Lehigh Gap, G. M. Greene; Paterson, J. A. Grossbach; Phillipsburg, J. M. Green; Rutherford, E. G. Lensley; Trenton, E. L. Dickerson; Tuckahoe, J. W. Green; Westwood. *Pennsylvania*: Darby, J. W. Green; Delaware Co., George Greene; Easton, J. W. Green; Glen Olden, George Greene; Hanover, Barber and Bridwell; Overbrook, George Greene; Philadelphia, G. M. Greene; Roxborough, Halmbach. *Maryland*: Baltimore, F. E. Blaisdell; Berwyn, F. C. Pratt; Cabin John, F. Knab; Chesapeake Beach, F. Knab; Glen Echo, J. C. Bridwell; Occoquan, J. C. Bridwell; Plummers Island, E. A. Schwarz; Riverdale, D. H. Blake; Riverview. *District of Columbia*: Woodridge. *Virginia*: Arlington, on *Oenothera biennis* Linn., D. H. Blake, C. H. Popenoe; Charlottesville, L. C. Woodruff; Dead Run, Fairfax Co., R. C. Shannon; Falls Church, G. M. Greene; Fredericksburg, W. D. Richards; Ft. Monroe, Hubbard and Schwarz; Old Point Comfort, D. H. Blake; Portsmouth, I. J. Condit; Nelson Co., W. Robinson; Vienna, W. S. Abbott. *West Virginia*: White Sulphur Spgs., W. Robinson. *North Carolina*: Valley of Black Mts., W. Beutenmiller; Round Knob, Hubbard and Schwarz; Southern Pines, A. H. Manee. *Georgia*: Barnsville, T. L. Bissell. *Louisiana*: Bossier Parish, W. F. Turner. *Mississippi*: Columbus, P. N. Oman; Grenada Co., J. A. Wilcox. *Texas*: Dallas, Houston, J. L. Ward, Wickham; Longview. *Tennessee*: Wickham. *Kentucky*. *Illinois*: Glen Ellyn, F. Knab. *Ohio*: Hocking Co., Franklin Co., Fairfield Co., Greene Co., all by J. A. Wilcox. *Michigan*: Big Rapids, N. F. Howard; Detroit, Hubbard and Schwarz; Marquette, B. Notman; Port Huron, Hubbard and Schwarz. *Wisconsin*: Waupaca, L. G. Gentner; Madison, J. E. Dudley. *Iowa*: Ames, Story Co., P.

and C. Vaurie; Iowa City, Wickham, Buchanan; Lake Okoboji, Buchanan. *Missouri*: C. V. Riley; Columbia, W. S. Craig. *Kansas*: Douglas Co., F. H. Snow; Elk City, M. W. Sanderson; Lawrence, L. S. Henderson; Mt. Hope, Wickham; Onaga, Howard Deay; Riley Co., E. A. Popenoe; Topeka, E. A. Popenoe; Winfield, C. E. Burt. *Nebraska*: Omaha, H. Soltau. *Arkansas*: southwest. *Oklahoma*: Muskogee Co., J. A. Wilcox; Payne Co., R. E. Bird. *South Dakota*: Dupree, Chamberlain, Cavour, Vayland, all by H. C. Severin. *Colorado*: Denver, H. Soltau; Greeley, Wickham. *Arizona*: Carrizo, D. J. and J. N. Knull; Oak Creek Canyon, 8000 ft., F. H. Snow. *California*: Castle Crag, A. Fenyés. *Washington*: N. Yakima, Wickham; White Salmon, W. W. Baker.

*Remarks.* The beetles in the LeConte and Melsheimer collection labelled *pubescens* are the same species, and there is little doubt about what Melsheimer described as *pubescens*. They are distinctive in having proportionately longer elytra than is usual in the genus, and are also unusual in being rather finely and not coarsely pubescent. The head lacks the usual transverse impressed line or depression across the front dividing the upper from the lower front. The distribution of this species is like that of its hostplant, *Oenothera biennis* Linn., widespread over the country, and the beetles present little variation in appearance in their wide range, also an unusual feature in this genus.

#### GRAPHOPS CURTIPENNIS (Melsheimer)

##### Plate 2, figures 1, 2

*Eumolpus curtipennis* Melsheimer, Proc. Acad. Nat. Sci. Phila., vol. 3, 1847, p. 169.

*Heteraspis curtipennis* LeConte, Col. of Kansas and eastern New Mexico, Smithsonian Contrib., 1859, pp. 23, 24.

*Graphops curtipennis* LeConte, Trans. Am. Ent. Soc., vol. 12, 1884, pp. 26, 27. Horn, Trans. Am. Ent. Soc., vol. 19, 1892, p. 205.

Oblong oval, shining with a bronzy or coppery lustre, eyes prominent, pronotum with punctures in transverse lines forming wrinkles, elytra with light pubescence in lines converging towards suture at the apex.

Head with outstanding eyes projecting out from the prothorax,

shiny although faintly alutaceous, with short inconspicuous white pubescence, the pubescence about eyes not as thick as usual in the genus, the punctures a little coarser in lower front than in upper, the division between the upper and lower front marked by a lightly impressed line, not grooved, and uniting with the impressed median frontal line; clypeus nearly straight across, only slightly curved. Antennae as usual in the genus. Prothorax approximately a third wider than long with rounded sides, shiny, the punctures in transverse lines, making the disc wrinkled. Elytra with prominent humeri, rather densely but finely punctate in basal half, the punctures on the side being impressed and wrinkled, in apical half indistinct; pubescence light and short and in lines converging towards suture. Body beneath and legs lightly pubescent and finely punctate. Claws with short inner tooth, front femora with a tiny tooth. Length 2.7 to 3.5 mm.: width 1.4 to 1.8 mm.

*Type* ? in LeConte collection, Museum of Comparative Zoology, collected in Pennsylvania, by Melsheimer. Hagen<sup>11</sup> wrote of the Melsheimer collection that LeConte took specimens from it which he incorporated into his own collection and according to Hagen they may be recognized by the shorter pin. In LeConte's collection the specimen bearing the name *curtipennis* Mels. has the shorter pin of Hagen's description and bears a pink disc (indicating the Middle States). I believe that this may be regarded as the Melsheimer type. In the Melsheimer collection is a specimen labelled *curtipes* in Hagen's (?) writing to which H. S. Barber has attached the label "type of *curtipennis*." This is not the same species as that in the LeConte collection bearing the short pin. To me it does not seem wise to question LeConte's recognition of this distinctive little species and to attach too much importance to a specimen in the Melsheimer collection of whose history we know so little—a specimen labelled, I believe, by Hagen, which is of approximately the same size and coloration—when we have in LeConte's own collection bearing the label *curtipennis* a specimen undoubtedly of Melsheimer's collection. LeConte in naming specimens has identified this little species with the prominent eyes and wrinkled pronotum as *curtipennis* pretty generally in collections throughout the country, and it has gone under that name for many years undisputed. H. S.

<sup>11</sup> Hagen, Canadian Ent., vol. 16, 1884, pp. 191-197.

Barber insisted that Melsheimer's description of the "transverse arcuated impressed line" on the front of the head applied more to *marcassita* than to this species, but it can well apply to this species too. In fact there are very few in the genus without that line. The description of the pronotum as "minutely punctured and rugulose" certainly applies to *curtipennis*. The specimen labelled *curtipes* has a finely punctate but not at all rugulose pronotum.

*Other localities.* *Canada:* Ontario: Toronto, R. J. Crew and A. Fenyés, Normandale, W. J. Brown; Walsingham, W. J. Brown. *Maine:* Monmouth, C. A. Frost. *New Hampshire:* Manchester, W. S. Abbott. *Massachusetts:* Mt. Tom, F. Knab; Springfield, F. Knab. *New York:* top of Mt. Whiteface, J. M. Aldrich; Oswego, Wickham; Karner, J. A. Wilcox. *Connecticut:* Mystic, R. H. Beamer. *New Jersey:* Da Costa, F. Knab; Davisville; Glassboro, W. F. Rapp; Lakewood; Lucaston, G. M. Greene; Sicklerville, W. F. Rapp; Ramsay. *Washington, D. C.:* H. S. Barber, W. A. Donnell, F. H. Chittenden. *Maryland:* Glen Echo, J. C. Bridwell. *Virginia:* Dawson Beach, 4 m. south Occoquan, on *Hypericum perforatum*, J. C. Bridwell; Bull Run, J. C. Bridwell; Virginia Beach, A. D. Hopkins; Ft. Monroe, Hubbard and Schwarz. *North Carolina:* Graybeard. *Michigan:* Midland, R. Dreisbach. *Iowa:* 7 m. n.w. Thompson, G. O. Hendrickson; Ames, G. O. Hendrickson; Sioux City, Slater and Laffoon. *South Dakota:* Bad Lands, Kadoka, Coster, G. I. Gilbertson; 15 m. south Mission, Todd Co., Hicks, Slater, and Laffoon. *Kansas:* Lawrence, Warwick Benedict. *Oklahoma:* Muskogee, J. A. Wilcox. *Arkansas:* southwest. *Mississippi:* Montgomery Co., J. A. Wilcox. *Louisiana:* Pear River, H. Soltau. *Texas:* Belfrage collection.

*Remarks.* This species has an unusually wide range, occurring from Canada to Texas and from the Atlantic states to the Dakotas and southward. Specimens from the western plain states appear more robust but not otherwise different.

In the South occurs a race that is at least subspecifically different. It is shinier and more coppery and often even metallic green in color, and with more slender, not so broad elytra. H. S. Barber has attached the name "*schwarzi*" to a series collected by E. A. Schwarz at Capron, Florida, and I propose to perpetuate the name as a subspecies of *Graphops curtipennis*.

## GRAPHOPS CURTIPENNIS SCHWARZI n. subsp.

*Type* and 7 paratypes, U.S.N.M. Type No. 62347 collected at Capron, Florida by E. A. Schwarz and H. G. Hubbard.

*Other localities.* *Florida:* Atlantic Beach, A. T. Slosson; Baldwin, Schwarz; Cedar Keys, Hubbard and Schwarz; Daytona; Enterprise, D. M. Castle, Hubbard and Schwarz; Fort Pierce, on pepper; Gomez; Gainesville, P. T. Riherd; Hilliard, E. G. Wegenek; Jacksonville, A. T. Slosson, Ashmead; Kissimmee, Charles Palm; Lacochee, J. D. Beamer; Lake Placid, J. G. Monticello; Lake Mary; Lake Lucy; Lakeland; LaBelle; Ormond, A. T. Slosson; Palmdale, Blatchley, on St. Andrews Cross; Pebbly Beach, Jacksonville; Plymouth; Punta Gorda, Hubbard and Schwarz; Rockbluff, M. D. Leonard; Sanford, E. T. Van Duzee; Suwannee Spgs., L. D. Tuthill; Stark, R. H. Beamer; Tampa; St. Petersburg. *Georgia:* Adel, E. G. Wegenek; Clinch Co., N. J. and E. L. Sleeper; Okefenoke Swamp, L. T. Hardy; Tybee Island, Kaebel. *Alabama:* Grand Bay, H. P. Loding; Mobile, H. Soltau. *South Carolina:* Clemson College, J. S. Watts; Ten Mile Station, Charleston, D. H. Blake.

*Remarks.* In Fall's collection are several specimens of this coppery colored race from Florida that he set aside from the specimens of the northern localities. C. A. Frost has labelled this a new species (without name) in J. A. Wilcox's collection.

## GRAPHOPS NEBULOSA (LeConte)

## Plate 3, figures 1, 3

*Heteraspis nebulosus* LeConte, Col. of Kansas and eastern New Mexico, Smithsonian Contrib., 1859, pp. 23, 24.

*Graphops nebulosus* LeConte, Trans. Am. Ent. Soc., vol. 12, 1884, pp. 26, 27.  
Horn, Trans. Am. Ent. Soc., vol. 19, 1892, p. 205.

Oblong oval, shining, faintly alutaceous, bronzy or coppery black, with coarse white hairs in patches on both prothorax and elytra, punctation of prothorax irregular with impunctate roundish bare areas near the middle of the disc, and the punctures in places densely congregated making thereby a little depressed area; elytral punctation coarser at base.

Head with the cleft connected across the front by a depressed line, the lower front more coarsely punctate; a median depression

or depressed line in the upper front; pubescence in a pattern, very heavy near the eyes; the clypeus with a rounded, concave emargination verging into a wide angled emargination. Antennae with the six basal joints shining with a bronzy or coppery lustre, the distal joints more pubescent and wider. Prothorax nearly as long as wide, with rounded sides, punctation irregular in groups of thickly clustered punctures and between these roundish bare areas without punctation near the middle of the disc; the pubescence in scattered patches, more regular on the sides. Elytra with coarse striate punctures in basal half, the punctures in the apical half fine and inconspicuous, the first two lines impressed; scattered patches of strong white hairs forming something of a pattern on the elytra. Body beneath with regularly placed dense white hairs, denser on the sides of breast and abdomen. Claws widespread with a short tooth at base. Length 4.8 mm.; width 2.5 mm.

*Type*, probably a female, and one paratype, also female, in the LeConte collection, Museum of Comparative Zoology, with a green disc. LeConte wrote the locality as "Kansas, near Ft. Laramie," now Wyoming, on the Platte River.

*Other localities.* *Saskatchewan*: Great Sand Hills, west of Swift Current, A. R. Brooks; Pike Lake, A. R. Brooks; N. Battleford, N. Criddle. *Alberta*: Taber, E. H. Strickland; Lethbridge, J. H. Pepper. *Montana*: Helena, Wickham. *South Dakota*: Parmelee, G. I. Gilbertson; Buffalo, Fox Ridge, Martin, Hecla, Walker, Yankton, all by H. C. Severin. *Minnesota*: Duluth. *Nebraska*: Sandhills. *Wyoming*: Cheyenne, H. Soltau, E. A. Schwarz, Wickham. *Colorado*: Colorado Springs, 6-7000 ft., Wickham, H. Soltau; Denver, H. Soltau.

*Remarks.* There is even greater variability in this species group, which in this paper is regarded as composed of *G. nebulosa* (LeConte), *G. smaragdula* (LeConte), *G. tenuis* and *G. nigella* (the last two described here), than in any of the others except *G. varians* LeConte. With our present knowledge it is impossible to say whether these are distinct species or subspecies or mere color forms. LeConte, who described the coppery *nebulosa* and green *smaragdula* as separate species, later came to the conclusion that they were the same. The third species, here described as *nigella*, a black beetle, has been generally confused with *obscura* LeConte. And the tiny bronzy beetle found in



Texas and New Mexico, here described as *tenuis*, may be simply a dwarf race. All four are alike in the head formation, in having a wide-angled clypeal emargination often appearing almost rounded, in the pronotum having roundish impunctate areas, and in the elytral pubescence being in patches of denser hairs. On the other hand, the aedeagi although similar present small differences. And there seems to be some geographic distribution peculiar to each of them. So far the green *smaragdula* appears to occur from Wyoming southward to New Mexico and Texas, and *nigella* has been taken so far only in Colorado (at higher elevations) and Manitoba. The small *tenuis* is from Texas and New Mexico. And *nebulosa*, typical form, is taken in more northern localities, from Wyoming northward, many records coming from Canada.

#### GRAPHOPS SMARAGDULA (LeConte)

##### Plate 3, figure 5

*Heteraspis smaragdulus* LeConte, Col. of Kansas and eastern New Mexico, Smithsonian Contrib., 1859, pp. 23, 24.

*Graphops nebulosus* LeConte, Trans. Amer. Ent. Soc., vol. 12, 1884, pp. 26, 27; Horn, Trans. Amer. Ent. Soc., vol. 19, 1892, p. 205.

Narrowly oblong oval, shining metallic green above, deep bronzy or coppery beneath with the legs also bronzy; alutaceous with regularly placed long white appressed hairs on the sides, rubbed elsewhere; punctation not dense on prothorax, and the striate punctures on the elytra not dense.

Head deeply cut by the groove about the eyes, and a distinct depression across front connecting the cleft, and a slight dent on the vertex; clypeus as in *nebulosa* with rounded or wide-angled emargination; well rounded over the occiput, alutaceous and finely and densely punctate; the pubescence inconspicuous except about the eyes and on the sides. Antennae as usual in the genus. Prothorax not quite so long as wide with rounded sides, shiny, indistinctly alutaceous, strongly but not densely punctate with small roundish impunctate areas; a few white closely appressed hairs on the sides (rest rubbed off?). Elytra distinctly alutaceous but shiny metallic green, the striate punctation well marked but not closely placed, becoming finer after middle; regularly placed

white appressed hairs on the sides, rubbed off on the disc. Body beneath and legs bronzy, abdomen densely but not coarsely punctate, the pubescence thicker on the sides of breast; claws as in *nebulosa*, widespread. Length 4.2 mm.; width 2.2 mm.

*Type* ? a female, with a green disc (habitat as given by LeConte "one specimen found at Ft. Laramie"—Wyoming, on the Platte River), in the LeConte collection, Museum of Comparative Zoology. A second specimen, also with a green disc, is about the same size, with patches of white pubescence on the elytra and small roundish impunctate areas on the prothorax. It is not the bright metallic green of the type, but duller and more bronzy.

*Other localities.* *Colorado*: Denver, H. Soltau; Canon City, H. Soltau; Pueblo, H. Soltau; northern Colorado, Wickham; Haswell, W. Benedict. *West Kansas*: Popenoe; Norton Co. *New Mexico*: Willard, Wickham, Casey Collection; Clayton, Wickham; Wiegand Ranch, Fall Collection; Estancia, J. R. Douglas. *Texas*: 4 miles north of Marfa, Barber, Russell, Lattimore.

*Remarks.* As stated above, the localities for the green *G. smaragdula* appear to be more southern than those for *G. nebulosa*.

#### GRAPHOPS NIGELLA n. sp.

#### Plate 3, figure 2

Oblong oval, alutaceous dull black, only faintly shining under the abundant rather coarse white pubescence, the pubescence in thicker patches on the elytra; prothorax rather irregularly punctate with areas of close punctation and bare impunctate ones, as in *nebulosa*, the striate punctation of the elytra moderately coarse becoming indistinct apically.

Head dull alutaceous black with finer punctures on upper than on lower front; a shallow transverse depression between the clefts about the eyes, and a median vertical impressed line on the front; clypeus with a rounded emargination that in some specimens appears widely angular; pubescence about eyes long and dense, on vertex forming a pattern. Antennae as usual in the genus. Prothorax not quite so long as wide, evenly convex, rather irregularly punctate with clusters of punctures forming little depressions and bare impunctate areas; pubescence moder-

ately long and conspicuous, radiating from the middle. Elytra dull alutaceous black with striate punctures moderately coarse in basal half, becoming fine and indistinct apically except in the impressed row near the suture; the white pubescence dense and long and tending to be in patches. Body beneath and legs covered with white pubescence that is thicker on the sides of the metasternum and abdomen. Claws widespread with an inconspicuous inner tooth. Length 3.5 to 5.1 mm.; width 1.8 to 2.7 mm.

*Type* male and 20 paratypes U.S.N.M. Type No. 62346, from Denver, Colorado, H. Soltau; 1 paratype in Museum of Comparative Zoology.

*Other localities.* *Colorado:* Denver, also collected by Hubbard, Schwarz, and Wickham; Greeley, Wickham, H. Soltau; Hugo, C. O. Marsh; "Colorado," Charles Palm, American Museum of Natural History. *Manitoba:* Brandon, Wickham.

*Remarks.* In the LeConte collection under *Graphops obscura* are two specimens from Colorado. They are possibly the source of the confusion regarding the identity of *G. obscura*, the type of which is quite different from these two specimens following it. LeConte may have confused them, because of the black color, with *obscura* as in his brief description of *obscura* he mentions one point that applies to these rather than his first specimen, namely that the pubescence is coarse, which is not the case in the specimen with the label. That specimen is unusual in having as fine pubescence as does *G. pubescens* (Melsheimer), as well as being unusual in the strong dense punctation of the prothorax, which LeConte mentions first in his description. In all the collections examined, the specimens like the ones here described as *nigella* have been labelled *G. obscura* LeConte, and nowhere have I found them rightly placed near *nebulosa*. In fact I am not certain that this may not be merely a color form of *nebulosa* although the aedeagus appears somewhat different, and the general dull black appearance of the beetles is quite unlike the shiny metallic green of *smaragdula* or the coppery bronzy lustre of *nebulosa*.

GRAPHOPS TENUIS n. sp.

Plate 3, figure 4

Narrowly oblong oval, alutaceous but shiny bronzy black, pro-

thorax distinctly and moderately densely punctate, elytra with striate punctures distinct to beyond the middle, finer towards apex; pubescence long, rather coarse and dense and in patches on the elytra.

Head alutaceous but somewhat shiny beneath the coarse white pubescence, pubescence heavy about eyes, upper head finely and moderately densely punctate; a depressed line down vertex and another between upper and lower front, lower front more coarsely punctate, clypeus emarginate with a wide angle verging into a rounded concavity. Antennae as usual in the genus. Prothorax not quite as long as wide with rounded sides, alutaceous but shiny, densely and distinctly punctate with moderately dense, white, closely appressed pubescence. Elytra shiny although alutaceous, without convexities, a slight depression below humeri with the striate punctures larger there, and the pubescence also thicker there, the striate punctures distinct to beyond the middle, finer towards apex; pubescence moderately long and coarse, tending to be denser in patches, as along the base, before the middle and at apex. Body beneath alutaceous and finely punctate with the white pubescence thicker along the sides. Claws with a short basal tooth. Length 3 to 4 mm.; width 1.6 to 2 mm.

*Type* male, U.S.N.M. Type No. 62340, collected at Alpine, Texas, June 28-30, from the Wickham collection.

*Other localities.* *Texas*: 14 miles north of Ft. Davis, July 24, 1945, on *Gaura parviflora*, J. H. Russell; Muslene (?) on morning glory; "Texas," Schaeffer collection; Dalhart, Wickham; Brownsville, May 1943, A. J. Chapmann; Bangs, February 16, 1939, Cristonsen; Galveston, F. H. Snow (Kansas U. collection); San Antonio, F. C. Pratt; "Texas," Belfrage. *New Mexico*: Las Vegas, Cockerell; 11 miles east Tolar, on *Salsola pestifer*, V. E. Romney.

*Remarks.* This may be a small race of that protean species, *G. nebulosa* LeConte. There is little to separate the two except the smaller size and a slight difference in the aedeagus. It is also very similar to the one here described as *G. exilis* from Victoria, Texas, but in general the pubescence is denser and coarser and the aedeagus is quite different in having an acute tip.

## GRAPHOPS EXILIS n. sp.

## Plate 2, figure 3

Narrowly oblong oval, bronzy black beneath the white, closely appressed pubescence, the pubescence tending to be denser in places in patches; prothorax finely and densely punctate, elytral striate punctures coarser in basal half, rather indistinct in apical half.

Head shiny, finely punctate above, more coarsely punctate in lower front; a depression, scarcely a groove, between upper and lower front, the pubescence light and inconspicuous except about eyes; the clypeus with a wide angled, almost rounded, emargination. Antennae as usual in the genus. Prothorax not quite as long as wide with slightly rounded sides, finely and rather densely punctate, with sometimes small roundish smooth areas on the disc; pubescence light and inconspicuous and closely appressed. Elytra narrow with small humeri, a slight depression below the humeri in which the striate punctures are larger and the pubescence more marked; the surface shiny, not clearly alutaceous with coarser punctures in basal half becoming fine and inconspicuous in apical half, only the row near the suture distinct and impressed; the pubescence fine, tending to be in denser patches, an area of this along the basal margin, another in the depression below the intrahumeral sulcus and on the undersurface denser along the sides of breast and abdomen. Body beneath alutaceous and very finely punctate with light pubescence. Claws with a short basal tooth. Length 3.4 to 3.9 mm.; width 1.7 to 2 mm.

*Type*, male, and 3 paratypes. U.S.N.M. Type No. 62339, collected at Victoria, Texas, August 29, 1913, by J. D. Mitchell.

*Remarks*. This is very similar to *G. tenuis*, described here from Texas and New Mexico, but is in general less conspicuously pubescent with finer hairs. The aedeagus is the only certain means of differentiating the two. In *G. exilis* the aedeagus has a wide tip which is in contrast to the pointed tip of *G. tenuis*.

## GRAPHOPS OBSCURA LeConte

## Plate 1, figure 1

*Graphops obscurus* LeConte, Trans. Am. Ent. Soc., vol. 12, 1884, pp. 26, 27; Horn, Am. Ent. Soc., vol. 19, 1892, p. 205.

Slender oblong oval, dull black, not shiny, distinctly alutaceous and coarsely and densely punctate, with flatly appressed fine white pubescence; prothorax convex and very densely and moderately coarsely punctate, faintly shiny; elytra with large round striate punctures to beyond the middle, more indistinct towards apex.

Head faintly shining, alutaceous, lightly pubescent, finely punctate above and more distinctly in lower front; a slight depression in upper middle front and between the cleft about eyes, a lightly impressed line; clypeus widely and shallowly angulate emarginate. Antennae with the five basal joints shiny, the distal joints wider and hairier. Prothorax a little wider than long with rounded sides; fairly convex and very densely and for the genus coarsely punctate with round deep punctures; alutaceous, faintly shiny, with fine, moderately dense, short white pubescence. Elytra without any basal callosities, humeri small, and little intrahumeral depression; the striate punctures round and large to beyond the middle, then becoming finer; very alutaceous, not at all shiny, with flatly appressed, not very dense fine white pubescence, evenly distributed and of about the same quality as the pubescence of *G. pubescens*. Body beneath covered with fine white pubescence, thicker on the sides of the breast and abdomen; shallowly and finely punctate; claws with tiny basal tooth scarcely discernible. Length 4.5 mm.; width 2 mm.

*Type*, a male in the LeConte collection, Museum of Comparative Zoology, labelled "Col."

*Remarks*. This is a very distinct species, unlike any other that I have seen in its dull, alutaceous, deeply punctate, black surface. There is no other specimen like it in any collection that I have examined and only one in the LeConte collection. Following it are two other specimens of another species, both females, with less alutaceous surface and with coarser pubescence not evenly distributed but in patches. They are described in this publication as *G. nigella* and are closely related to *G. nebulosa*.

#### GRAPHOPS MARCASSITA (Crotch)

#### Plate 6, figures 1, 2

*Graphops marcassitus* LeConte, Trans. Am. Ent. Soc., vol. 12, 1884, pp. 26, 27; Horn, Trans. Am. Ent. Soc., vol. 19, p. 205.

Broadly oblong oval, somewhat shiny although alutaceous, bronzy black with finely and not very densely punctate prothorax, and elytra with coarser striate punctures becoming finer towards apex; pubescence not very coarse.

Head alutaceous and densely punctate, the pubescence in the type much rubbed but visible about eyes and on sides, the groove between the upper and lower front connecting the cleft about eyes more or less distinct but variable in its depth in different specimens; above this a wide but shallow vertical impression on the front; clypeus small and concavely emarginate. Antennae as usual in the genus. Prothorax a little wider than long, large in proportion to the whole beetle, and moderately convex, alutaceous and finely and not densely punctate, the punctures near the base in transverse lines, the pubescence much rubbed but a little visible around the sides. Elytra short, broad, the humeri moderately prominent, the strong but not very dense striate punctures becoming finer beyond the middle; surface shiny although faintly alutaceous, the pubescence not very coarse, a depression below the humeral sulcus and in this a more alutaceous area; along lateral margin in apical half the punctation indistinct and a little puckering on the sides. Body beneath with the abdomen shallowly punctate and lightly pubescent, the pubescence heavier on the sides. Claws with a short inner tooth. Length 3.8 mm.; width 1.9 mm.

*Type* ? a female, in LeConte collection, Museum of Comparative Zoology, labelled "*H. marcassita* Zimm." and with an orange disc (according to Crotch's description from the "Middle and Southern States"). Besides the Zimmermann specimen are three others, two with pink discs (Middle States) and one with an orange disc labelled "J. L. LeConte" with a red type label (fixed by N. Banks?). Below this are 5 other specimens, 3 from Haulover, Florida, which are *G. floridana* described in this paper, and 2 labelled "W. T." (Washington Territory), which are the western subspecies described below.

*Other localities.* *Quebec:* Aylmer, W. J. Brown; Brome, W. J. Brown. *Ontario:* Arnprior, Carp, Delhi, Leamington, all by W. J. Brown. *New Hampshire:* Durham, W. S. Abbott. *Massa-*

*chusetts*: Chicopee, Holyoke, Springfield, all by F. Knab. *Connecticut*: Cornwall, L. B. Woodruff; Milford, F. Knab. *Rhode Island*: Watch Hill, W. Robinson. *New York*: New York City; Highland Park; Ithaca, Chittenden; West Point, W. Robinson; Rockaway Beach, L. I. *New Jersey*: Anglesea; Chester, Halmbach; Hopatcong, Charles Palm; Paterson, G. M. Greene; Wenonah, Halmbach. *Pennsylvania*: Colemanville, at root of strawberry, F. C. Pratt; Delaware River Gap, Wickham; Lehigh Gap, G. M. Greene; Philadelphia, G. M. Greene; Water Gap, Charles Palm. *Maryland*: Beltsville, L. L. Buchanan; Bladensburg, Hubbard and Schwarz; Cabin John, D. H. Blake; Glen Echo, J. R. Malloch; Lake Short, on strawberry; Plummers Island, W. L. McAtee, H. S. Barber, E. A. Schwarz. *Washington, D. C.*: Hubbard and Schwarz. *Virginia*: Arlington, D. H. Blake; Glencaryn, F. Knab; Great Falls, Occoquan, Vienna, all by J. C. Bridwell. *West Virginia*: White Sulphur Spgs., W. Robinson. *North Carolina*: Valley of Black Mts., W. Beutenmuller. *Tennessee*: Nashville, on strawberry. *Michigan*: Eagle Harbor, Lake Superior. Hubbard and Schwarz; Marquette, Hubbard; White Fish Point, Lake Superior, Hubbard and Schwarz. *Illinois*: Pulaski, S. C. Chandler, reared from strawberry. *Indiana*: Clark Co., Purdue; Pekin, on strawberry. *Wisconsin*: Bayfield, Wickham; Hortney, H. A. Robinson. *Iowa*: Muscatine, on strawberry, C. E. Smith; Ames. *Missouri*: St. Louis, G. W. Broek. *Nebraska*: Dodge. *North Dakota*: Sentinel Butte, K. Cooper. *South Dakota*: Buffalo, Eureka, Kadoka Bad Lands, all by H. C. Severin; Brookings, M. Frederiksen; Black Hills, J. L. Webb. *Wisconsin*: Racine, on strawberry. *Montana*: Kalispell, Wickham; Assiniboine, Hubbard and Schwarz. *Wyoming*: Jackson's Hole. *Colorado*: Custer Co., T. D. Cockerell; Colorado Spgs., H. Soltau; Empire, 8500 ft., Wickham; Leadville, 10,000 to 11,000 ft., Wickham; Leavenworth Valley, 9,000 to 10,000 ft., Wickham; Silver Plume, 9,000 to 10,000 ft., Wickham; Marshall Pass, Wickham. *Manitoba*: Brandon, Wickham; Aweme, N. Criddle; Onah, N. Criddle; Riding Mt. Park, W. J. Brown. *Alberta*: T. N. Willing.

*Remarks.* In the Melsheimer collection is a small specimen of this species which was labelled by Hagen (?) as "Melsh. *curtipes*." H. S. Barber has attached to this a label indicating



it is the type of *curtipennis* Melsheimer (see discussion under *G. curtipennis*). This small specimen is one of a number of diminutive size that I have examined that might possibly be a subspecies of *marcassita*. These smaller specimens seem to be from the northeastern states. With the exception of the Melsheimer one, presumably from Pennsylvania, one taken on strawberry at State College, Pennsylvania, and one from Angora, Pennsylvania, the others that I have seen are five from Tyngsboro, Mass., one from "Mass.," one from "New Hampshire," one from Port Williams, Nova Scotia, in the Ottawa collection. In the Blanchard collection, labelled "*nebulosus*" are four from Tyngsboro, Mass., one from Mt. Washington, and one from N. Conway, New Hampshire.

Another race of slightly different appearance is from Washington State. William W. Baker has collected them in numbers there on strawberry. At first H. S. Barber thought that they were a new species, but from his later notes it is evident that he regarded them as a subspecies of the eastern *G. marcassita* which he called:

GRAPHOPS MARCASSITA PUGITANA n. subsp.

Plate 6, figure 3

Shinier, less alutaceous, prothorax more finely punctate with shorter, less conspicuous pubescence than the eastern specimens.

*Type.* a male and 30 paratypes. U.S.N.M. Type No. 62374, collected at Grand Mound, Washington, on strawberry, in April, May, June, August and October, by William W. Baker. Another series of 10 specimens, taken at Grand Mound, Washington, by Arthur Hanson and W. W. Baker is in the California Academy of Sciences.

*Other localities.* Washington: Chinook Pass, C. W. Getzen-daner; Easton, W. W. Baker; Puyallup, W. W. Baker; Spanaway, W. W. Baker; Rochester, W. W. Baker; Tenino, Hubbard and Schwarz.

GRAPHOPS SIMPLEX LeConte

Plate 1, figures 4, 5, 6

*Graphops simplex* LeConte, Trans. Am. Ent. Soc., vol. 12, 1884, pp. 26, 27;  
Horn, Trans. Am. Ent. Soc., vol. 19, 1892, p. 205.

Oblong oval, moderately shiny, bronzy black, with very short, fine, white pubescence that is in lines on the elytra, and not conspicuous, semierect at apical end of elytra; prothorax moderately densely but not coarsely punctate, elytra with dense punctation, wider than prothorax, with prominent humeri.

Head distinctly alutaceous and finely, not densely punctate, a median depressed area in front, the groove not extending across front but ending in a line with the inner edge of the antennal socket; scanty fine hairs about eyes and on sides of front; clypeus deeply angulate emarginate. Antennae with basal joints shining, distal ones pubescent. Prothorax with rounded sides, shiny although finely alutaceous, densely and not coarsely punctate, a few fine inconspicuous short hairs on sides. Elytra broader than prothorax and with unusually broad squarish humeri, densely and distinctly punctate, the punctures so dense as to seem confused, but regular striae of somewhat coarser punctures faintly discernible; shiny, very finely pubescent, the short fine white hairs being in more or less regular lines and erectish towards the apex. Wings unusually well developed. Body beneath alutaceous but shiny, densely and strongly punctate and with fine, inconspicuous white pubescence. Claws with a long basal tooth. Length 3.9 mm.; width 2.3 mm.

*Type*, female, in the LeConte collection, Museum of Comparative Zoology, from Lavaca Co., Texas, collected May 27. Two specimens with a similar label are in the U. S. National Museum from the collection of C. V. Riley, which may be regarded as isotypes. Besides the type in the LeConte collection are 7 others, 3 without locality labels, simply numbers (929, 430, 431), and 2 very small specimens with Texas labels, 1 large green beetle from Topeka, Kansas, and 1 small blue-green one with the number 432.

*Other localities.* *Kansas*: Ft. Scott, H. Soltau; Riley Co., Popenoe; Topeka, Popenoe; Lawrence, W. J. Brown. *Oklahoma*: Norman. *Mississippi*: State College, J. R. Chamberlain. *Texas*: Brownsville, on *Oenothera* sp., J. C. Bridwell; P. A. Glick; J. Shiller; Corpus Christi, F. C. Pratt; Belfrage collection; Dallas, C. R. Jones; on *Physalis*, W. D. Pierce; Goliad, E. A. Schwarz; Victoria, on *Rudbeckia* sp., J. D. Mitchell.

*Remarks.* Lefèvre's description of *Scelodontia bicolor* (see page 299) fits this beetle pretty well but the locality "Illinois" does not,

and since the type is not available, I believe it is better to take a name that we are certain of rather than a doubtful one, particularly since no specimen from east of the Mississippi or as far north as Illinois has been seen.

This species is one of the most easily recognized of the genus because of its dense elytral punctation and broad squarish elytra under which the wings are fully developed. As in so many others of the genus there is wide variability in size and color, some specimens being less than 3 mm. long, and in color varying from bright metallic bluish green to bronzy black.

#### GRAPHOPS BERYLLINA LeConte

##### Plate 5, figure 4

*Graphops beryllinus* LeConte, Trans. Am. Ent. Soc., vol. 12, 1884, pp. 26, 27;  
Horn, Trans. Am. Ent. Soc., vol. 19, 1892, 205.

Oblong oval, alutaceous but shiny metallic blue green under the coarse white pubescence; prothorax not very shiny, densely and deeply punctate, the elytra with coarse striate punctures, closely set.

Head with the cleft about eyes almost connecting across the lower front, an impressed line between the upper and lower front, and a lightly impressed median vertical line down the front; front covered with moderately dense punctures, each with a closely appressed white hair. Clypeus deeply angulate emarginate. Antennae dark with the basal six joints having a greenish lustre, remainder wider and more densely covered with pubescence. Prothorax almost as wide as long, alutaceous, not very shiny, the punctures dense and deeply cut in irregular transverse rows radiating from the middle, the intervals forming ridges, more apparent in the basal part; a coarse but not long white pubescence on the sides (?rubbed elsewhere). Elytra alutaceous but shiny metallic blue green, with deep, coarse, closely set striate punctures, and between these rows finer shallower punctures, (? scars from rubbed off hairs); intervals between the striate punctures slightly costate, this being more apparent on the sides and at apex; pubescence closely appressed, moderately long, and not in patches but evenly and not densely covering the elytra. (In the type specimen the pubescence is much rubbed.)

Body beneath densely punctate and with coarse white pubescence, especially thick on the sides of breast and abdomen. Claws with a short basal tooth. Length 5.8 mm.; width 3.2 mm.

*Type*, a female, in LeConte collection, Museum of Comparative Zoology, from "Col."

*Other localities.* *Nebraska*: Sandhills, H. Soltau; Sandhills, northwest Nebraska, Kansas College collection; Alliance, Wickham; Halsey, R. Cushman. *Minnesota*: Fertile, A. G. Richards, H. T. Spieth. *South Dakota*: Aberdeen, Gettesburg, both by H. S. Severin. *Wyoming*: Hulett, Cook Co., C. & P. Vaurie.

*Remarks.* This is one of the largest species of the genus and is a brilliant metallic blue green or green in color, a robust, coarsely punctate beetle with the white pubescence evenly distributed. There is only one specimen in the LeConte collection. It most closely resembles *G. varians*, but is larger, and the prothorax is more densely and deeply punctate, and not very shiny, and the elytral punctures closer.

#### GRAPHOPS VARIANS LeConte

Plate 4, figures 1, 2, 3, 4; Plate 5, figure 3

*Graphops varians* LeConte, Trans. Am. Ent. Soc., vol. 12, 1884, pp. 26, 27;  
Horn, Trans. Am. Ent. Soc., vol. 19, 1892, p. 205.

Oblong oval, shining although faintly alutaceous, blue green with long, white, evenly distributed pubescence; prothorax moderately convex and broad, densely punctate but the punctures not so deep or ridged as in *G. beryllina*, elytra with striate punctation not so closely set as in *G. beryllina*, and becoming fine at the apex.

Head with the cleft about eyes extending well into the front and connecting with an impressed line across front, the clypeus deeply angulate emarginate, lower front a little more coarsely punctate than upper, pubescence long and moderately dense. Antennae as usual in the genus. Prothorax a little wider than long, quite convex, shining, strongly and densely punctate but not in ridged lines. Elytra moderately shiny although alutaceous, the first two striate lines impressed entire length, the others becoming indistinct towards apex. Abdomen strongly and densely punctate; the pubescence thicker on the sides of breast and

abdomen. Length 5 mm.; width 2.8 mm.

*Type*, ? female, from Kansas, in LeConte collection, Museum of Comparative Zoology. The second specimen, of coppery color, is a female from Texas, and has a closely appressed dense pubescence that completely covers the beetle but not so as to obliterate the punctation beneath. The punctation of the pronotum is not so deep or dense and the prothorax not rounded out at the sides as in the type specimen. The third specimen, without locality label, is a deep dark blue with the pronotal punctation not so strong, and the elytra with long white pubescence. The fourth and fifth specimens from Illinois are coppery with a rosy lustre, and in these also the pronotal punctation is not so strong or dense as in the type.

*Other localities*. Specimens similar to the type specimen are represented in other collections as follows: *Kansas*: Belvedere; West Kansas, Popenoe; Clark Co., 1962 ft., F. H. Snow; Riley Co., Kimbal. *Missouri*. *Colorado*: Eckley, R. H. Beamer.

Specimens similar to the type but a little smaller and less heavily pubescent, shining metallic green, from: *Kansas*: Meade Co., R. H. Beamer; Scott Co.; H. O. Deay. *South Dakota*: Hot Springs, Fred Bingham; Gettesburg, Fort Ridge, Newell, all collected by H. C. Severin; Brookings, R. A. Vickery. *Manitoba*: Aweme, N. Criddle, on *Oenothera pallida*; Treesbank, R. D. Bird. *Washington*: Leavenworth (this last locality seems improbable).

Specimens similar to the dark blue one in the LeConte collection from: *Kansas*: Jewell Co., Howard Deay. *Iowa*: Sioux City, Jean L. Laffoon; 7 miles n.w. Thompson, Sargeant Bluff, Oak Grove State Park; 4 miles s. Westfield; 6 miles n.w. Ledyard, all collected by G. O. Hendrickson.

Coppery colored specimens more or less similar to the two from Illinois in the LeConte collection: *Central Missouri*: specimens in the Schaeffer, Riley and Casey collections. *Kansas*: F. H. Snow and A. Fitch collections; Riley Co., Popenoe. *Iowa*: Solon, L. Buchanan.

In addition to these is another race represented by 5 specimens from Georgia in the Museum of Comparative Zoology that are coppery colored, and one from Fall's collection, labelled Kenessa Mt. (? Kennesaw Mt.), Georgia, P. W. Fattig, that is metallic green, but apparently the same race. These are similar to the more

western specimens in having a deeply angulate emarginate clypeus and a similar aedeagus, but they appear broader and more convex.

*Remarks.* Many more specimens are needed for an understanding of this variant group, together with biological study, before any conclusions can be drawn as to the specific status of the beetles. All of these specimens, although seemingly unlike, appear to have no really distinct structural characters.

The type specimen of *G. varians* is remarkably like that of *G. beryllina* LeConte, but is slightly smaller with a shinier, less densely punctate pronotum in which there is no ridging. The elytral punctation is not so closely set as in *G. beryllina*.

#### GRAPHOPS WYOMINGENSIS n. sp.

##### Plate 6, figure 4

Oblong oval, shining bronzy black under the coarse, moderately dense white pubescence; prothorax strongly but not densely punctate, elytral punctation becoming indistinct towards apex.

Head covered with long white pubescence, distinctly and densely punctate, a median vertical depression on front and a very slight transverse depression between the upper and lower front; clypeus emarginate with a wide angle, not quite a curved concavity. Antennae as usual in the genus. Prothorax a little wider than long with the sides not much curved, not at all bulging at the middle, shining under the white pubescence, faintly alutaceous, strongly but not densely punctate. Elytra with small humeri and slight intrahumeral sulcus, a faint depression running down from this that is more alutaceous than the rest of the surface, the striate punctures not dense or large and towards the apex becoming indistinct; pubescence moderately long, coarse and dense, not in patches but evenly distributed; wings not much longer than elytra and narrow. Body beneath covered with moderately long white pubescence, the abdomen not very distinctly punctate. Claws with an exceedingly small inconspicuous basal tooth. Length 3.6 to 4.1 mm.; width 2 mm.

*Type* male and 2 paratypes, 1 male, 1 female, U.S.N.M. Type No. 62338, from Laramie, Wyoming. Attached to one specimen is a note by H. S. Barber bearing the annotation " 'Nisw'

in C. F. B.'s handwriting on Laramie label, may mean Niswander, fide Ckll." (presumably the collector's name).

*Other localities.* 1 specimen in American Museum of Natural History, from Cheyenne, Wyoming, June 13, 1920, at 8500 ft.; 1 specimen in N. Y. State Museum, from Como, Wyoming, Williston, collector.

*Remarks.* H. S. Barber had set these three specimens apart from the rest as being distinct, although he attached no manuscript name to them. On one is a small note written by him, "Penis much smaller than in *nebulosus* or *obscurus*." In size they are about the same as *G. marcessita* (Crotch), but are covered with heavier, denser pubescence and the elypeal emargination is more angular, and the prothorax has only slightly curved sides.

GRAPHOPS BARBERI n. sp.

Plate 2, figures 4, 5

Narrowly oblong oval, alutaceous but moderately shiny, metallic blue green, with fine, short, not dense white pubescence; prothorax densely but not coarsely punctate, elytra with striate punctures becoming fine towards apex.

Head well rounded over occiput, a slight median vertical line and a depression between upper and lower front, shiny, the upper part more finely punctate than lower, a slightly rounded wide angular emargination of the elypeus. Antennae as usual in the genus. Prothorax nearly as long as wide, moderately convex, with rounded sides, punctation not very coarse except at sides and on prosternum, there the punctures coarser and more confluent; shining, faintly alutaceous, very little evidence of pubescence. Elytra a little wider in apical half, the humeri small with short intrahumeral sulcus, the striate punctures strong in basal half becoming much finer after the middle; the fine, closely appressed white pubescence rubbed or non-existent in most specimens examined. Undersurface and legs densely punctate, wings small and undeveloped, the pubescence light except on the sides of metasternum; claws with a short basal tooth. Length 4.6 to 5.3 mm.; width 2.4 to 2.6 mm.

*Type* male and 6 paratypes U.S.N.M. Type No. 62343, from Flagstaff, Arizona, collected in July by H. F. Wickham.

*Other localities.* 1 specimen from the Schaeffer collection labelled "Arizona." Three specimens in the American Museum of Natural History from Tucson, Arizona. Five specimens in California Academy of Sciences, 4 from "Arizona," Van Dyke collection, and one from Flagstaff, E. Schiffel, in J. W. Green collection; one specimen in the Kansas University collection from Magdalena Mts., N. M., F. H. Snow. Two specimens from Flagstaff, Arizona, A. Fenyes; one from Tucson, Arizona, in Fall's collection.

*Remarks.* A series of 12 specimens collected on the North Rim of the Grand Canyon, 8,000 to 9,100 ft., by D. Rockefeller in the American Museum of Natural History collection is somewhat unlike the others. The specimens are from 4 to 5 mm. in length and in general a little smaller than the Flagstaff ones, and the elytra are wrinkled in the basal half. The tip of the aedeagus is a little differently shaped also. As in the Flagstaff specimens the wings are small and poorly developed.

H. S. Barber recognized this as new and had attached a manuscript name to it which I have changed in dedicating this species to him.

#### GRAPHOPS COMOSA n. sp.

##### Plate 5, figure 1

Oblong oval, shining coppery or bronzy black beneath the dense coarse white hairs that on the elytra are irregularly vittate in pattern; prothorax coarsely and rugosely punctate, elytra with coarse striate punctures becoming finer towards apex.

Head with bulging occiput so that the eyes are not as visible from above as in the other species; covered with dense coarse white hairs over occiput and about eyes, not quite so dense on lower front; alutaceous and finely punctate; the cleft about eyes connected across the front by a faintly marked line and with a median vertical line down the front; clypeus deeply angulate emarginate. Antennae as usual in the genus, the distal joints graying with the thick pubescence. Prothorax somewhat wider than long, the surface shining and with deep coarse and often rugose punctation, sometimes in lines radiating from the centre, and often with depressed areas near the curve of the prosternum;



over this and normally concealing the punctuation is a dense, closely appressed white pubescence radiating from the median line. Elytra moderately convex with small humeri and rather poorly developed wings, the striate punctures coarse and closely placed, becoming finer towards apex; pubescence dense, coarse and white and in unrubbed specimens having somewhat vittate appearance. Body beneath and legs similarly covered with dense white hairs. Claws with a long basal tooth. Length 4.5 to 5.5 mm.; width 2.4 to 2.9 mm.

*Type*, male, and 35 paratypes U.S.N.M. Type No. 62341, collected 18 miles north of Imperial, Texas, July 10, 1949 by J. H. Russell on *Gaura parviflora*.

*Other localities*. 20 miles east of Pecos, Texas, July 28, 1946 on *Gaura parviflora*, J. H. Russell; 12 miles west of Clovis, New Mexico, July 23, 1945, J. H. Russell; 5 miles south of Melrose, N. M., August 21, 1949, J. H. Russell. One specimen in the Kansas University collection from Midland, Texas, collected July 18, 1927 by L. A. Stephenson.

*Remarks*. H. S. Barber had recognized this as a new species and had attached a manuscript name to it. It has the heaviest pubescence of any of the genus, the elytral punctuation being entirely concealed by the coarse white hairs in unrubbed specimens so that the beetles present a grayish appearance not unlike *Glyptoscelis*. The bulging occiput that nearly conceals the eyes from above is another distinctive character.

#### GRAPHOPS VIRIDIS n. sp.

##### Plate 5, figure 2

Oblong oval, moderately shiny although alutaceous, metallic blue green, the pronotum and elytra (in basal part) strongly and densely punctate, the white pubescence evenly distributed.

Head alutaceous and finely punctate, more strongly punctate on lower front, a median line down front and also a transverse line separating the upper and lower front, the clypeus small and slightly rounded, not angularly emarginate but almost truncate; pubescence moderately dense. Antennae as usual in the genus. Prothorax about a fourth wider than long with well rounded sides, moderately strongly and densely punctate, with

a few small bare areas, the punctures becoming finer anteriorly; a fine short pubescence, not at all concealing punctation. Elytra convex, without much intrahumeral sulcus, the striate punctures in basal part strong and between them numerous finer punctures, surface moderately shiny, metallic blue green, finely alutaceous and with fine white pubescence, evenly distributed and not at all obscuring the punctation. Body beneath finely punctate and with short fine pubescence. Legs bronzy. Claws with a short basal tooth. Length 4.1 mm.; width 2.2 mm.

*Type*, female, U.S.N.M. Type No. 62342, from Swift Current, Saskatchewan, Canada, collected in September 1882.

*Remarks*. This beetle with its wide prothorax and its rounded sides, convex elytra and green metallic coloration reminds one of the beetles of the *varians* complex. H. S. Barber has labelled it as *G. varians*, in fact. But it is a smaller beetle and the clypeus instead of being deeply angulate emarginate is almost straight across, and truncate and small. The dense punctation at the base of the elytra is like that in *G. pubescens*, but the elytra are not elongate and narrow as in that species. The head is similar to *G. marcassita* but I have never seen a metallic green beetle of that species nor one with the dense elytral punctation. It is unlike *G. wyomingensis* in not having the pubescence in patches, as well as being a broader beetle.

#### GRAPHOPS FLORIDANA n. sp.

##### Plate 6, figure 5

Oblong oval, faintly shining, black, occasionally with a bronzy gleam, alutaceous, lightly covered with short white pubescence, on either side of the scutellum an oblong patch of denser white hairs; elytra with distinct and moderately coarse striate punctures in basal half becoming much finer towards apex; anterior and posterior femora with a small tooth.

Head dull, alutaceous, finely and densely punctate, a little coarser in lower front, with short, inconspicuous white hairs not very dense; the cleft about eyes not connected across the front by an impressed line or groove; a small frontal depression; clypeus almost straight across, only slightly curved or very widely angulate emarginate. Antennae as usual in the genus.

Prothorax about a fourth wider than long, densely and not coarsely punctate, with punctures tending to be in lines, lightly pubescent. Elytra with prominent humeri and very little intrahumeral depression, the striate punctation distinct, moderately coarse and sparse in basal half and along sides, inconspicuous in apical half; surface distinctly alutaceous, only faintly shining, and with short pubescence, on either side of scutellum an oblong patch of denser white hairs. Body beneath faintly shining, very finely punctate and with fine, not dense white pubescence. Anterior and posterior femora with a small tooth, claws with a short basal tooth. Length 3 to 4 mm.; width 1.5 to 2.2 mm.

*Type* male and 6 paratypes U.S.N.M. Type No. 62344 collected at Tavares, Florida, July 18 by Hubbard and Schwarz.

*Other localities.* *Florida:* Punta Gorda; Bartow, Sumpter Co.; Keys, Orange Co.; N. Smyrna, all collected by Hubbard and Schwarz; Ft. Myers (in American Museum of Natural History); Dunedin, W. S. Blatchley; "Ch. Har.," A. T. Slosson. *Alabama:* Oak Grove, H. Soltau; Mobile, H. Soltau. *South Carolina:* Florence, G. F. Ramwater; Saluda Co., on wild plum, W. P. Turner; Black Beard Is., Wild Life Refuge. Four specimens in Bowditch collection labelled "Fla.," 3 in LeConte collection (1 from Haulover, 2 from Orange Co., Fla.), are placed under *G. marcassita* Crotch. In Blanchard's collection is one from Southern Pines, N. C., collected by A. H. Manee. In the Fall collection is one from Edgewater, Fla. collected by C. A. Frost that Fall has labelled as a new species, without a name. There are 4 other specimens in his collection from Orlando, Fla., D. M. DeLong; Florence, S. C.; St. Simons Is., Georgia, C. A. Frost; and Savannah, Ga.

*Remarks.* H. S. Barber has labelled this as a new species and given the name *floridana* to it. It is readily recognized by the oblong white patches on the elytra near the scutellum and by the toothed femora and dull black alutaceous elytra. Specimens from Alabama and South Carolina are more finely punctate and in this regard approach the northern subspecies, which is represented by only three specimens, two from New Jersey and one from Long Island, described as

## GRAPHOPS FLORIDANA BOREALIS n. subsp.

## Plate 6, figure 6

Oblong oval, faintly shining, alutaceous, bronzy black with densely and finely punctate prothorax and finely striate punctate elytra, with short fine, inconspicuous pubescence. Anterior and posterior femora toothed.

*Type*, female, U.S.N.M. Type No. 62345, collected at Amagansett, Long Island, by W. T. Davis in September 1910.

*Other localities*. New Lisbon, New Jersey, May 31, 1937, L. J. Bottimer.

*Remarks*. Only three specimens of this are known, two from New Jersey and one from Long Island, but all three differ from the southern race in having much more finely and more inconspicuously punctate elytra and in lacking the conspicuous white patches of white pubescence on either side of the scutellum. They seem to be a little smaller, ranging from 2.9 to 3.4 mm. in length.

## GRAPHOPS PUNCTATA n. sp.

## Plate 1, figure 3

Narrowly oblong oval, faintly shining although alutaceous, bronzy black, the white pubescence evenly distributed, the pronotum finely and densely punctate, the elytra with distinct and closely set striate punctures visible to the apex; clypeus with deep angular emargination.

Head shining under the white pubescence, finely punctate above and a little more distinctly punctate in lower front, the transverse depression between the upper and lower front distinct and well marked, a slight median frontal dent, clypeus with deep angular emargination. Antennae as usual in the genus. Prothorax about a fourth wider than long with well rounded sides, finely and densely punctate with fine, closely appressed white hairs somewhat feathery in arrangement on the sides. Elytra with small humeri, not much wider than prothorax and about twice as long, faintly shining under the evenly distributed white pubescence, the striate punctures closely set, strong and deep and distinct to the apex. Body beneath densely and strongly punctate, covered with white pubescence which is thicker on

the sides of the metasternum. Claws with an exceedingly small and inconspicuous basal tooth. Length 3.6 mm.; width 1.6 mm.

*Type*, a male, M.C.Z. Type No. 29350 with a pale pinkish disc (? Middle States).

*Remarks*. I have seen only one specimen, an old one in the Museum of Comparative Zoology without any locality label. The beetle is unquestionably different from any of the others. It may be recognized by its rather slender elongate shape, the strong dense striate punctures on the elytra, and the deeply angulate emarginate clypeus. The aedeagus is also unique in the shape of the tip.

## DOUBTFUL SPECIES

### GRAPHOPS BICOLOR (Lefèvre)

*Scelodontia bicolor* Lefèvre, Ann. Soc. Ent. Fr., (5) vol. 7, 1877, p. 164.

“Minor, breviter oblonga, corpore subtus cum capite, antennarum basi, pedibusque omnino, subcupreo-aenea, nitida. prothorace elytrisque cyaneis. Long. 3-3½ mm.; lat. 1½-1¾ mm. Illinois (Lefèvre coll.).

“Caput subtilissime alutaceum, disperse punctulatum, utrinque supra oculos sulco profundo oblique instructum, in media fronte foveolatim impressum, epistomata antice trianguliter emarginato, mandibulis oculisque nigris. Prothorax paulo latior quam longior, lateribus utrinque rotundatus, sat crebre undique punctulatus, subtilissime transversim strigatus. Scutellum triangulare, apice subrotundatum, in medio punctis nonnullis instructum. Elytra prothorace basi latiora, pubis subtile adspersa, tenuiter sublineatum sat dense punctata. Abdomen crebre undique punctatum, subtiliter albidosericeum. Pedes subelongati, femoribus totis subtus muticis.”

This description fits pretty well *Graphops simplex* LeConte with which it has been identified, but because I have not seen specimens from east of the Mississippi River or north of Kansas, I am unwilling to adopt Lefèvre's name for that species.

## GRAPHOPS CUPRAEA (Provancher)

*Metachroma cupraea* Provancher, Le Nat. Can., vol. 10, 1878, p. 383.

*Scelodonta nebulosa* Horn, Trans. Am. Ent. Soc., vol. 13, Monthly Proc., 1886, p. xiv.

*Graphops ? pubescens* Horn, Trans. Am. Ent. Soc., vol. 19, 1892, p. 206.

“Long. .15 pce. D'une cuivré uniforme dans toutes ses parties, à l'exception du labre et des mandibules qui sont noirs. Tête finement ponctuée, les sillons autour des yeux profonds et convergents au milieu du front, celui-ci avec une ligne fortement enfoncée en avant. Prothorax transversal, fortement arrondi sur les côtés, à ponctuations fines et peu denses sur le disque, plus fortes sur les côtés. Elytres à stries à peine indiquées à la base par les lignes de points, à ponctuations très fines et sans ordre au delà du milieu, leur épipleures aussi ponctuées. Pattes de la couleur du corps. Capturée au Cap Rouge.”

H. S. Barber has left the following note about this species: “Horn 1886<sup>12</sup> says *M. cupraea* Prov. is *Scelodonta nebulosa* Lec., and that he examined the type, but in his revision six years later Horn included *cupraea* doubtfully under *pubescens*. Clavareau 1914 wrongly places both citations in synonymy under *pubescens* omitting the queries while Leng 1920 readopts the questioned synonymy used by Horn.”

W. J. Brown of Ottawa, Canada, has written me concerning this problem, “Regarding *Metachroma cupraea* Prov., because of the colour of the name label (blue) and the late date on which the species was described, I would expect the type to be in the “second” collection. But there is no specimen in either collection bearing any indication that it is the type. The “second” collection contains three specimens of *Graphops*, two over the label *Heteraspis pubescens* Melsh., one over that of *H. “marassitta”* Zimm. All of these are *marassitus* of our collection, if I am right in believing that only that species and *pubescens* of our collection occur in Quebec. Perhaps Provancher did not return the type to the *cupraea* label after Horn returned it to him (1886, Trans. Am. Ent. Soc., 13, xiv), for there is no specimen with that label now.”

In view of the fact that Horn determined the strawberry *Graphops (marassita)* sent him by Forbes as *nebulosa*, it may

<sup>12</sup> Horn, Trans. Am. Ent. Soc., vol. 13, Monthly Proc., 1886, p. xiv.

be that he did the same in looking at Provancher's *cupraea* and, as Mr. Brown also surmises, Provancher's *cupraea* may really be *marcassita*. On the other hand, the description of the punctuation as being very fine and without order to the middle of the elytra seems to be that of *pubescens*.